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**Intra-cytoplasmic Sperm Injection**  
(The Ultimate Cure For Male Infertility)



using



Olympus IX71 on3  
Narishige Micromanipulator

at

**CHAWLA  
INFERTILITY CLINIC  
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**KEEPING UP WITH THE TIMES**

## What is ICSI?

Intra-cytoplasmic sperm injection (ICSI) is a laboratory procedure developed to help infertile couples undergoing in vitro fertilization (IVF) due to male factor infertility. ICSI, a form of micromanipulation, involves the injection of a single sperm directly into the cytoplasm of a mature egg (oocyte) using a glass needle (pipette). This process increases the likelihood of fertilization when there are abnormalities in the number, quality, or function of the sperm. ICSI is a relatively new technique, first performed in 1993.

## Causes of male infertility

A variety of abnormalities can cause male infertility. Sperm can be completely absent from the ejaculate (azoospermia) or present in low concentrations (oligospermia). Sperm may have poor motility (asthenospermia) or have an increased percentage of abnormal shapes (teratospermia). There may also be functional abnormalities, which prevent the sperm from binding to and / or fertilizing the egg. Despite these concerns, ICSI is a major advance in the treatment of severe infertility.

## Indications for ICSI

- Very low numbers of motile sperm.
- Severe teratospermia.
- Problems with sperm binding to and penetrating the egg.
- Antisperm antibodies thought to be the cause of infertility.
- Prior or repeated fertilization failure with standard IVF methods.
- Frozen sperm limited in number and quality.
- Obstruction of the male reproductive tract not amenable to repair. Sperm may then be obtained from the epididymis by a procedure called microsurgical epididymal sperm aspiration (MESA), or from the testes by testicular sperm aspiration (TESA).

## The Procedure

After the eggs are harvested and identified by the

embryologist, the outer layer of cells around each egg, known as the cumulus oophorus, is removed. The cumulus oophorus is made up of hormone secreting cells known as granulosa cells. Removing the granulosa cells reveals the outer shell around the egg known as the zona pellucida. By using a powerful microscope we are able to isolate a single sperm, aspirate it into an extremely thin glass pipette and inject it through the zona pellucida into a single egg. In the image below, the pipette on the left is used to hold the oocyte in position while the glass pipette on the right is injecting a sperm into the cytoplasm.

## The goal of ICSI

The goal of performing ICSI is to minimize the risk of fertilization failure. It is very important to understand that it is not just sperm numbers that matter here. When sperm are in reduced numbers or have abnormal morphology and motility, the function of the sperm can be significantly impaired. While there may be plenty of sperm for fertilization, their ability to penetrate the outer layer of the oocyte, the zona, may be impaired. ICSI overcomes this by placing a single sperm within the egg.

## Facts about ICSI

There is less than 15% ova damage. 70% of microinjected ova will produce embryos. 90% of attempts result in embryo transfer. Fertilization occurs in 50% to 80% of injected eggs. Approximately 30% of all ICSI cycles performed result in a live birth. Younger patients may achieve even more favorable results.

## The wonder of ICSI

The wonder of ICSI lies in the fact that the pregnancy rate with this technique is the same as with conventional in vitro fertilization for tubal factor infertility. ICSI allows many infertile couples to become parents of their own genetically-related children, as an option to Therapeutic Donor Insemination (TDI) or adoption.

